

## HOT WATER – A TOWN MEETING

### Objectives:

Students will:

- apply basic principles and strategies in debating water resource issues in a public forum format
- recognize the effectiveness of reason-based presentations.

### Materials:

- 4x6 inch note cards
- Copies of scoring ballots
- National Geographic's video *Mysteries Underground*



### Background:

Thousands of water-related debates occur across the world each day. Topics range from personal concerns to major issues, such as the loss of wetlands. There are a variety of views about each subject. Communications are necessary to ensure that all sides of an argument be heard so a fair decision can be reached leading to actions being taken. This is done in the form of a public forum.. Constructive speeches support and defend a viewpoint while rebuttal speeches refute an opposing one. You will be preparing a presentation for the town meeting.

### Procedure:

1. Present and review with students a well-known issue such as the reintroduction of wolves and discuss the different viewpoints that people have. Explain that the purpose of a town meeting is to provide an opportunity for two opposing sides to defend or argue a given proposition or viewpoint. Brainstorm thoughts that the students have about issues that they remember being debated.
2. Introduce the concept of a public forum and review the vocabulary (affirmative, negative, cross-examination, rebuttal, etc.). Review the purpose of a debate – to provide an opportunity for different viewpoints to defend or argue a given viewpoint, either positive or negative.
  - Constructive speeches support and defend a viewpoint. Research and evidence support their viewpoint.
  - Rebuttal speeches presents arguments supported by evidence to disprove or discredit the opposing viewpoint
3. Inform the students that they are about to develop a presentation about opening a new show cave in the community.
4. Have the students get into 8 groups. Assign each group one of the viewpoints on the following sheets (business people, cave conservationists, tourist industry, historians, purists wanting no change, scientists, geologists, general public).
5. Show the video (or parts of it) *Mysteries Underground* to give students an idea of the special things cave explorers can find. Give them time to research and prepare a stand. The opposing sides will then debate the issue and present their arguments at a town meeting.

6. Do all the members of each group agree with each other? How will they decide on one view to present?
7. When the research has been completed, assign a student for each group to act as spokesperson. These students will sit at the front of the classroom with the groups supporting the idea on one side and the groups opposing the idea on the other side. Students should stand when presenting their group's point of view. A moderator will recognize individuals and allot them time to speak. The moderator keeps notes on the important points shared to recap the presentations at the end of the meeting. The moderator needs to be a neutral party. It might be good to have a guest such as: another teacher, principal, or school secretary. The remaining students will score the presentations and vote at the end of the town meeting to decide what the town recommends. The debaters will present their arguments in accordance with the following time limits:

DEBATE SCHEDULE	Minutes (Middle school)	Minutes (High school)
Affirmative Constructive Speech	4*	8
Cross-examined by the Negative	2	3
Negative Constructive Speech	4	8
Cross-examined by the Affirmative	2	3
Negative, Rebuttal	2	3
Affirmative, Rebuttal	2	3

\* maximum time allowed in minutes

8. Randomly select who (affirmative or negative) gives their constructive speech first. Any speaker may give the first rebuttal. Preparation time for rebuttal may be allowed, but such time shall not exceed three minutes.
9. Copy enough scoring ballots for each person to have one for each team. The judging will be done by assigning values from 1 to 4 (with 1 being the most convincing argument and 4 being the least convincing) for both the constructive and rebuttal stages. In scoring, consider the following:

ANALYSIS:	Getting to the heart of the question
PROOF:	supporting contentions with sufficient and convincing evidence
ARGUMENT:	sound reasoning; logical conclusions
ADAPTATION:	clashing with or responding to the opposition
REFUTATION:	destroying opponents contentions; reinforcing your own
ORGANIZATION:	clear, logical presentation of material
SPEAKING:	effective delivery; favorable impact on audience

NOTE: While one viewpoint may "win" the debate, both teams have contributed to a deeper understanding and appreciation of cave and water issues and the controversies involved.

### The Cave:

This is a unique and incredible cave. It is being surveyed rapidly and is already over 60 miles long. The cave houses a rare species of bats that no one knew were in the area. The

cave has a formation that has never been found in any other cave in the world and it is in great abundance in this cave. There are microbes in the cave that are being studied for medical purposes. There are bones and artifacts in the cave that have not been identified or dated yet.

## **The Debaters**

### **Business People:**

You would love to have a new business in the community. Every new business helps bring money into the area, thereby giving you increased business. You will argue that opening the new cave up for tourism is the best decision for the community. You want to open and develop as much of the cave as possible. You would like to see a large gift shop highlighting area attractions and a restaurant located over the cave. You want to see the cave open without regard to the damage that might occur to the cave system.

### **Purists:**

You do not want any change. At all. Any kind of change. You think the community is fine as-is and there is no reason to change anything. For any reason.

### **Tourists Industry:**

You have seen how successful other caves are and how much attraction and money they bring to an area. This could be the thing to put your town on the map. You want to do everything possible to get this cave developed. You want to contact the media, cave publications, other caves, etc. to tell everyone about this exciting new cave. You know it can do nothing but benefit the community. You think the cave can be properly protected and through education you can help the public learn to protect this and other caves as well as the bats living there and also provide an opportunity for the public to learn more about the geology of the area.

### **Scientists:**

You realize there is too much to be studied in this unique cave for it to be opened to the public, at least at this time. There are microbes in the cave that you are studying and are hopeful that they could lead to cancer cures and cures for other diseases like Alzheimers. There are bats in the cave that are exceptionally rare. No one has ever seen them in your area. If people get into the cave, it will disturb the bat roost and potentially cause them to leave the area. Having fewer bats could result in more insects and more possibility of disease from the insects. You want to keep the bats there and study them. You also know that people are afraid of bats and might try to destroy the roost site. You have the opportunity to research in an undisturbed area and do not want to risk human interference in your studies. You know that people walking through the cave will leave behind lint from their clothing and hair. You know people will throw money, candy, tobacco, etc. into the cave pools and make them impure. You know that people will touch the cave and the oils from their skin or clothing may stop the speleothems from forming. All of these things will interfere with your research.

### **Cave Conservationists:**

You want to keep people out of the cave for the sake of the cave. The formations in the cave (feel free to describe them) have never been seen before. Because of this, you are sure if people are in the cave the formations will be damaged and destroyed. More cave is being found all the time. Soon it could be a world record cave and if parts of it are destroyed, you feel the cave would lose importance. You are not interested in the science in the cave, you feel the scientists would do just as much damage as tourists. Caves like Carlsbad Caverns, Cave of the Winds, Beautiful Rushmore Cave, etc. have suffered a similar fate and you want to finally see a cave protected. You feel the cave should be open only to explorers and no one else or it will be irreparably damaged. You feel exploration is necessary to find and protect all of the cave... you can't take care of what you don't know about. You know the parking lot above the cave will send runoff of hydrocarbons cave that has not had a proper chance to be filtered into it and will contaminate it. You are worried about buildings over the cave letting sewage and bacteria enter the local drinking water supply, which is connected to the cave. You are worried about the effect this will have on the native cave life as well. (For a positive outlook on this topic explore the history of Kartchner Cave in Arizona. Their website is: [http://www.pr.state.az.us/kartchner/kart\\_history.html](http://www.pr.state.az.us/kartchner/kart_history.html). )

### **Geologists:**

The cave you are studying is unique. Because of this nature, you want to make it a place of learning, not one to be damaged and walked through by people who are just there for pleasure and will not learn from it. You are able to trace the water flow through the cave and make important conclusions about recharge, pollution, and the depleting groundwater in the area all by studying the cave. You know that if the cave is developed, a parking lot will be put near it and the hydrocarbons from there will contaminate the cave. You know the runoff from the visitor center, gift shop and restaurant will contaminate the cave and potentially damage the water supply of the area. You want only scientists to be able to go in the cave.

### **Historians:**

You are interested in the cave for archaeological and recent historical values. There are writings in the cave that refer to the Celebrated Caverns of America with various letter codes blackened in candle soot... you want to determine what these mean. There are drawings and pictographs, which have yet to be dated or identified. There are rock scrapers and points in several rooms in the cave. There are broken pieces of pottery near pools in the cave. There are bones of human form and animal form that have not been identified. The cave entrance is not on federal land, but is adjacent to it. There is a federal law, the Archaeological Resources Protection Act that prohibits disturbing artifacts on federal land. The cave does go under federal land, so this needs to be considered. This area of the cave will not be open to the public, but it will be talked about and likely put on maps and you are worried that people walking through the cave will effect these precious artifacts. You know that lint accumulation will harm them and perhaps the added amount of carbon dioxide in the air will have a decaying effect on the cave drawings as they have in the caves in Spain. Certainly there will be damage done by blasting both to the rocks and to the natural air flow of the cave which will dry out the specimens and adding walkways to the cave will harm the remains. You are pushing for a full study to be done before the cave is opened. You would prefer if the cave were never to be opened.

**General Public:**

You would love to see a new cave. You have been to other caves, but always have to travel a long way to get there. You would enjoy seeing this cave open for your enjoyment. This will be a good learning opportunity for you in that you will be able to go to the cave and learn about the rock layers, water travel, etc. firsthand where you could only read about it before. The cave opening could bring more businesses and restaurants to your area. Yet you are concerned about travel to the town. You know that if there are more people, there will be more traffic, and more pollution in your area. This might change your area's water supply. Having the cave available to the public will mean more impact on the area water and could pollute or use too much of it. If people are doing damage to the water in the cave, this could cause serious damage not just to the local area, but to surrounding communities. This new development will interfere if you are thinking about a quiet hike, going fishing, taking a scenic drive, or having your kids walk to school safely. A new cave in the area would bring changes both positive and negative. Determine which one you feel strongest about and defend it.

After the debate, relate this to real life issues. This is often how decisions are made. Did the students feel emotional? Did they feel this was a fair system? What would their personal decision be about the issue? What actions would they take? Have they ever seen a real-lifetown meeting?

What if the cave was only a mile long? Would anyone make different decisions? What if there were fewer formations, or no bats, or no microbes in the cave? Would this make anyone feel like changing their opinion? What if the cave was formed by the river in the area and the river is still connected to the cave? Would this have an effect on the decision making?

After the debate, talk about caves like Lechuguilla Cave in New Mexico. The cave is in the Carlsbad Caverns National Park and is a highly protected cave. In the last 15 years, there have been over 106 miles of cave discovered. The cave has formations never seen before and never since. There are microbes in the cave that are being tested in laboratory situations as potential cures for breast cancer and leukemia. There are historic writings and an old bat roost in the cave. The cave is likely to go under Bureau of Land Management land very soon where there are surface oil and gas drilling allowed. The two federal agencies have recently worked together to establish an agreement that no drilling will be done in the area of the cave for several years in an effort to protect the cave. Only 6 teams of people are chosen to enter the cave each year: research teams, exploration teams, and restoration teams to clean up damage done in the past. This cave is very well known and yet its access is highly restricted. Congress has been so impressed with this marvelous underground area that they have declared it the only underground wilderness. This means that no development can happen there, not so much as the installation of a single light bulb, unless there is another act of Congress.

Ask the students how they feel about this. Ask them to think of caves they have been to in the past and remember the damage done to them. Is it worth it to damage a place like Lechuguilla

when there are already so many other caves to enjoy? Many of the bacteria in that cave are in the water. As tourists go by water, they often throw things in it. Copper leaching from a single penny would most likely kill the bacteria in any pool. What if this was the pool that had the cancer curing bacteria? What if it was lost to future generations because of one careless penny? How much thought do we need to give to the future when making decisions like these?

On the other hand Kartchner Cave State Park in Arizona is a spectacular cave that was discovered November 1974. The men, Randy Tufts and Gary Tenen, who discovered this cave kept their discovery a secret until 1978, when they told the property owners about their find. The Kartchner family explored the caverns with Tufts and Tenen over the next few years. This cave also has spectacular formations. There is a bat roost in the cave and the cave was entirely on private property. The family and the discoverers decided that the best option was to continue to keep it a secret. Soon, they realized that the caverns were too unique and fragile, and too important to risk vandalism or much worse since the family could not be vigilant about overseeing the cave. They decided to offer it to the state of Arizona as a State Park. The State Park System accepted the cave and, using the newest technology, has opened it to the public. So the debate about how to protect caves continues in the real world today. Your students might be interested in tracking the development of these caves over the next several years.

## Presentation Scoring Ballot

Team's Name: \_\_\_\_\_ Your Name: \_\_\_\_\_

**DIRECTIONS:** Circle the number that best describes the debater(s) you judged, and record your comments below. Remember, a score of 1 = the most convincing argument, and a score of 4 = the least convincing argument.

Overall Presentation:	1	2	3	4
	<b>score</b>			
<b>Constructive or Negative Speech (circle one)</b>	1	2	3	4
<b>Cross Examination of Opposing Side</b>	1	2	3	4
<b>Rebuttal:</b>	1	2	3	4
<b>Comments:</b>				